



Australian arsonists: an analysis of trends between 1990 and 2015

Therese Ellis-Smith^a, Bruce D. Watt^a and Rebekah M. Doley^b

^a*School of Psychology, Faculty of Society and Design, Bond University, Robina, QLD, Australia;*

^b*Doley Psychology Services, Varsity Lakes, QLD, Australia*

There have been few studies to date focused on identifying the characteristics of Australian arsonists, and a distinct absence of any analyses of trends in arson offending over time. In order to address this gap, the current study reviewed sentencing transcripts obtained across all Australian jurisdictions between 1990 and 2015, to identify trends in the features of arson offending and key characteristics of the arsonists, over this 25-year period. Offender characteristics such gender, motivation, Indigenous status and degree of exclusivity–versatility of the arson offending were considered. Trend analyses indicated substance use, mental illness and female gender to be increasingly significant factors in the commission of arson offences over time. Significant differences were identified between Indigenous and non-Indigenous arsonists, which raises questions as to the adequacy of current theory to explain firesetting in this group.

Keywords: arson offenders; arson treatment; Australian arson; female arsonists; Indigenous Australian arsonists; mental illness; substance use.

The costs associated with arson in Australia are increasing. In 2008 it was estimated that arson cost the Australian community \$1.6 billion per year (Rollings, 2008). That estimate was revised to \$2.3 billion in 2014 to include costs associated with fire, ambulance and volunteer services (Smith, Jorna, Sweeney, & Fuller, 2014). This estimate is likely to be conservative given the additional financial burden of police investigations, insurance claims and post-fire land management, along with the rebuilding of lives and businesses and the social impact associated with the loss of life and ecological damage (Muller, 2009).

The prevalence of arson crimes in Australia is high, but the clearance rates, or the percentage of arson crimes solved and successfully prosecuted, are consistently low. It has

been estimated that Australian fire services attend between 46,000 and 60,000 bushfires each year (Muller, 2009), and Bryant (2008) suggests that of these, up to 50% are suspicious, or confirmed to have been deliberately lit. Despite the cost and impact of arson, we know little about the perpetrators of these crimes in Australia, and even less about any emerging trends associated with their offending. It is not surprising, therefore, that few local treatment programmes designed to address the criminogenic needs of this group have emerged, despite the development of numerous programmatic responses to arson internationally.

The purpose of this study was to identify the characteristics of Australian arsonists, based on a sample of sentencing transcripts, from all jurisdictions, over a 25-year period to

Correspondence: Therese Ellis-Smith, School of Psychology, Faculty of Society and Design, Bond University, 14 University Drive, Robina, QLD 4229, Australia. Email: tellisssm@bond.edu.au

identify trends in arson offending and inform emerging treatment in this country. The development of robust and valid programmes must be based on empirical analysis, following the investigation of key characteristics of Australian arsonists, including any differences between Indigenous and non-Indigenous fire-setters. In doing so, this study also explored changes in the characteristics of arsonists over time. A range of general offence characteristics was identified, such as whether the offending occurred in company or alone, whether accelerants were used, the identified motivation for the offence and the type of property subject to the arson. The offender characteristics of particular interest were (a) the presence of a diagnosed mental illness in arsonists, (b) the use of illegal substances in the commission of the arson offence, (c) the type of motivation for the arson, and (d) whether arsonists demonstrated exclusive or versatile offending behaviours. This study also explored similarities and differences between Indigenous and non-Indigenous arsonists over the research period. The following section summarises the research on these three characteristics as they pertain to arsonists.

Mental health diagnoses

The research on the prevalence of mental health diagnoses within groups of firesetters is vast. An elevated prevalence of major mental illness including schizophrenia, major depression and personality disorder has been found in increasing proportions across a range of offender groups generally (Ogloff, Talevski, Lemphers, Wood, & Simmons, 2015), and a number of studies focused on convicted arsonists (Anwar, Långström, Grann, & Fazel, 2011; Ducat, McEwan, & Ogloff, 2013; Harris & Rice, 1996; Ó Ciardha et al. 2014; Vaughn et al., 2010). Behavioural factors such as a history of antisocial behaviour, aggression and impulsivity also consistently characterise those who set deliberate fires (Dickens et al., 2009), and cognitive and affective dysfunction associated with psychopathology may moderate

firesetting risk (McEwan & Ducat, 2016). In addition, personality traits such as poor self-esteem, high levels of impulsivity and a history of low tolerance to frustration (Gannon & Pina, 2010) are common. Firesetters with psychotic symptoms have been found to be a particularly dangerous group, who often target people in their use of fire, and they are likely to engage in fire-setting exclusively (Lindberg, Holli, Tani, & Virkkunen, 2005).

As some studies have drawn samples of firesetters from psychiatric or known mentally disordered populations, it is not surprising that estimates of mental illness have tended to be high (Dalhuisen, Koenraadt, & Liem, 2015; Dickens et al. 2007; Enayati, Grann, Lubbe, & Fazel, 2008; Green, Lowry, Pathé, & McVie, 2014; Tyler & Gannon, 2017; Tyler et al., 2013). Other studies, which considered general samples of firesetters, have found comparatively high rates of mental illness. Coid, Wilkins, and Coid (1999) considered a general, non-psychiatric sample of 25 female firesetters who were remanded in custody in the United Kingdom, and found a high prevalence of personality disorders (92%) and previous admissions to psychiatric care (84%) in this group. Rather than argue a causal relationship between mental illness and firesetting, Gannon, Ó Ciardha, Doley, and Alleyne (2012) suggest that mental illness contributes to an increased risk of firesetting by moderating existing psychological vulnerabilities such as communication problems, emotional regulation difficulties, offence supportive cognitions and fire interest scripts or schemas.

Substance use

The relationship between substance use and criminal activity is well established, with many studies providing evidence that substance use is a significant criminogenic factor (Bennett, Holloway, & Farrington, 2008; Fazel, Bains, & Doll, 2006; Koetzle, 2014; Lennings, Copeland, & Howard, 2003). The relationship between substance use and arson

has not been investigated specifically, despite increases in substance-use-related crime being noted worldwide in recent years, across a range of offending behaviours (Butken et al., 2011; DeMatteo, Filone, & Davis, 2015; Goldsmid & Willis, 2016; Wang et al., 2017). Increased substance use points to heightened volatility and dangerousness in the offending, as well as the need for treatment initiatives to consider this increased complexity in the offending behaviours. If, as expected, a similar trend is observed among arsonists over time in Australia, then treatment for firesetting must recognise and address this relationship.

Motivation

This study also investigated the apparent motivation for each of the arson offences reviewed over the 25-year period, and utilised the expressive–instrumental dichotomy developed by Canter and Fritzon (1998). This seminal study, based on 175 cases of solved arson crimes, used smallest space analysis to derive four modes of arson along two axes, these being person and object (expressive person, instrumental person, expressive object and instrumental object). The expressive–instrumental dichotomy informed the current study, whereby the category labelled instrumental included those offences where the motivation was clearly profit oriented or directed towards the elimination, or concealment of evidence, of another crime. Cases where the offence involved elements of self-pity, sexual excitement, delusional thinking or an expression of emotional distress were grouped as expressive. It was expected that in cases where there were indications of substance use and/or mental illness, the firesetting motivation would probably have an expressive quality. In contrast, firesetters with no history of mental illness or substance use were expected to be more likely to use fire for instrumental purposes.

Those cases where the primary motivation did not align easily with either of these categories, such as ‘anger prompting revenge or

payback’, were divided between the Instrumental and Expressive categories on the basis of whether the offence was planned or unplanned. Cases of unplanned anger prompting revenge or payback were assigned to the Expressive category, and those involving planned anger prompting revenge or payback were coded as Instrumental. Similar decisions were made for those cases where the primary motivation was ‘due to intoxication can’t recall or explain’ such that planned offences by firesetters who were intoxicated and could not explain their actions were considered to be more instrumental, and unplanned offences involving intoxicated firesetters were more likely to be expressive. The use of the variable ‘planned or unplanned’ was chosen as it was considered to be intuitively relevant to motivation (Canter & Fritzon, 1998).

Exclusive or versatile

Arson research suggests that arsonists are more likely to be versatile, as opposed to exclusive, in that their offending is not limited to the setting of fires (Brett, 2004; Doley, 2003a, 2003b). While there have been arsonists identified who do not engage in other types of offending and only set fires, and are therefore described as exclusive, they remain a small subset. In order to support or challenge previous findings (Ducat et al., 2013), and identify whether there are emerging trends in the versatility or exclusivity of firesetting in Australia, the current study investigated a national sample of Australian arsonists, in order to clarify the significance of the exclusive–versatile dichotomy for the identification of treatment needs.

Indigenous arsonists

As little is known about arson offending in Indigenous communities in Australia, this study also explored offender and offence features across Indigenous and non-Indigenous groups. This sample included both Indigenous and non-Indigenous arsonists, and given there

is no previous evidence of any difference in their firesetting behaviour, this study investigated similarities and differences between Indigenous and non-Indigenous arsonists to identify offenders characteristics and their offence behaviours. Notwithstanding the evidence of increased substance use and mental health concerns in Indigenous communities generally (Ferrante, 2012; Jorm, Bourchier, Cvetkovski, & Stewart, 2012; Wundersitz, 2010), given the absence of specific arson research in Indigenous communities, it was considered inappropriate to generate hypotheses in relation to any potential relationship between indigeneity and firesetting. Hence, a general exploration of similarities and differences between Indigenous and non-Indigenous groups was conducted.

This study tested four hypotheses. Specifically, it was anticipated that the proportion of Australian arsonists identified as having a mental health diagnosis had grown over the study period, and, secondly, that the use of illegal substances in the commission of arson offences also increased. Thirdly, it was expected that the majority of Australian arsonists would demonstrate a versatile range of offending behaviours, as opposed to firesetting exclusively. Lastly, it was anticipated that those identified with an expressive motivation for their firesetting would be more likely to have a history of mental illness and/or substance use. The analysis of trends or changes in the characteristics of arsonists since 1990 will inform investigative efforts and treatment responses, and will also contribute to the body of knowledge on arson behaviour. Given the prevalence of deliberate firesetting in Australia and the increasing costs associated with this criminal activity, this review, as the first of its type, is overdue.

Method

A sample of 305 sentencing transcripts of arson cases, heard between 1990 and 2015 from all Australian jurisdictions, was

collected. Sentencing transcripts of adult male and female arsonists were sourced through the www.austlii.edu.au website, and each jurisdiction also has its own database where court transcripts are freely available to the public. Some courts, such as the Australian Capital Territory Magistrates Court, did not make their sentencing transcripts available online until recently, while other courts, such as the South Australian Supreme Court and the Tasmanian Supreme Court, have published their sentencing comments since the 1980s. Search criteria included the terms 'arson' and 'attempted arson', as well as general search terms such as 'fire' and 'firesetting'. Only transcripts associated with adults convicted of arson or arson-related offences during this period were collected.

Court transcripts that were not primarily sentencing transcripts, such as those considering bail applications or other points of law, were excluded from this study. Transcripts that did not identify sufficient information about either the defendant or the offence were also excluded, as were duplicate transcripts from both a lower court and a Court of Appeal involving the same matter. Twenty-four transcripts were rejected for these reasons, resulting in a total of 305 transcripts meeting inclusion criteria.

The majority of the arson transcripts identified in this study were from the higher courts in each State and Territory, as higher courts are more likely to have published transcripts. Of the 305 transcripts, two were obtained from a Magistrates Court, 45 from a District or County Court, 86 from a Supreme Court and 172 transcripts from the various Courts of Appeal in each jurisdiction. Two jurisdictions, Queensland and Western Australia, did not publish sentencing transcripts from the Supreme Court, and only Court of Appeal transcripts were available from those states. The availability of published transcripts increased over time, such that most of the transcripts were obtained in the decade between 2006 and 2015.

Coding of transcripts

Each transcript was reviewed, and following a process of content analysis, 58 variables were coded. Some variables were coded as either present or absent, such as male gender, while others were coded into categories, such as mental health diagnosis. Offender variables recorded demographic information about each defendant, including whether they had any previous or current mental health diagnoses and details of any previous criminal convictions, including previous convictions for arson. The offending variables recorded details of the offences for which each defendant was convicted, and descriptive details of the offences where this information was available. This included any disclosed motivation for the arson, whether the offence occurred with co-offenders, whether substances were consumed or whether accelerants were used in the firesetting.

Data analysis

As the data obtained were largely categorical, non-parametric tests such as Pearson's chi-square test of independence were utilised to investigate the hypotheses. In relation to several variables, only transcripts where the presence or absence of that variable was specifically identified by the court were included. For example, the presence or absence of juvenile offending was expressly mentioned in 130 of the 305 transcripts. In some instances the type of motivation (Expressive or Instrumental) could not be identified due to a lack of information. Table 1 identifies the number of transcripts included in the analyses for each variable.

Trend analyses were conducted to identify patterns in the variables under review, and to make assessments about future scenarios based on extrapolations of past occurrences (Chandler & Scott, 2011). Projections were calculated where significant trends over the 25-year period were identified. The choice of variables for trend analysis was based on the research questions discussed above. These

were the frequency of mental health diagnosis and substance use in the commission of the offence. Two additional exploratory trend analyses were conducted, to consider whether arson offences by females and Indigenous people were changing over the period under review. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS Version 23).

Results

The majority of transcripts identified that defendants were charged with one count of arson ($n = 251$, 82.3% of sample), with the balance indicating between two and 21 charges. A range of sentences was identified; 28 transcripts (9.2%) identified the court awarded a community-based disposition, such as a fine or a community correctional order, and a further 26 cases, or 8.5% of defendants, were granted a combination sentence comprised of a period of imprisonment followed by a period of community-based supervision. In 3.6% of cases ($n = 11$) the defendant was detained under the relevant mental health legislation. The sentence awarded in 4.9% of cases ($n = 15$) was not identified. Imprisonment was ordered in the majority of cases ($n = 225$, 73.8%). Of those sentenced to imprisonment, 57% ($n = 128$) of defendants were sentenced to less than five years imprisonment. Some differences in the sentences handed to defendants were observed across jurisdictions. In particular, it was found that 100% of all arsonists sentenced in Western Australia were imprisoned, compared to just one third in South Australia, as depicted in Table 2.

Arsonist characteristics

Gender and age of defendants at time of offence

This sample was composed of 275 male arson defendants (89%) and 34 female defendants (11%). Of the 305 sentencing transcripts obtained, 258 identified the age of the

Table 1. Chi-square statistics for key variables across Indigenous and non-Indigenous groups.

Variable	χ^2	<i>df</i>	Cramer's <i>V</i> or ϕ	<i>n</i>
Gender	2.34	1	-.088	305
Sentences granted	20.37***	5	.258	305
Juvenile offending mentioned	4.18**	1	-.179	130
Exclusivity/versatility	0.92	1	-.059	264
Substance use mentioned	4.92**	1	.127	305
Co-offenders/solo	2.46	1	.090	305
Expressive/instrumental	19.62***	1	.259	293
Target of arson	5.33	3	.132	305
Use of accelerants	13.59***	1	.246	224
Previous convictions for arson	0.37	1	.054	127
MSO Murder/manslaughter	0.37	1	.035	305
Planned/unplanned offence	24.14***	2	.281	305
Mental health diagnosis	3.73	1	.143	183
M-TTAF trajectory	3.56	4	.113	279
Relationship status	2.39	1	-.104	222

Note: MSO = most serious offence; M-TTAF = Multi-Trajectory Theory of Adult Firesetting.

** $p < .05$. *** $p < .001$.

Table 2. Percentage of arsonists sentenced to imprisonment for each jurisdiction.

Jurisdiction	<i>n</i>	Imprisonment		
		<5 years <i>n</i> (%)	>5 years <i>n</i> (%)	Total <i>n</i> (%)
Queensland	61	30 (49.2)	17 (27.9)	47 (77.1)
New South Wales	50	23 (46.0)	23 (46.0)	46 (92.0)
Victoria	87	31 (35.6)	33 (37.9)	64 (73.5)
South Australia	27	1 (3.7)	8 (29.6)	9 (33.3)
Western Australia	30	21 (70.0)	9 (30.0)	30 (100.0)
Northern Territory	20	10 (50.0)	1 (5.0)	11 (55.0)
Tasmania	16	9 (56.3)	5 (31.3)	14 (87.6)
Australian Capital Territory	14	3 (21.4)	1 (7.1)	4 (28.5)
Total	305	128 (42.0)	97 (31.8)	225 (73.8)

Note: *N* = 305.

defendant at the time he or she committed the arson offence as between 17 years and 75 years ($M = 34$ years, $SD = 12.6$). A positive

skew value (0.845) indicated that scores were clustered to the left at the lower age values.

Table 3. Indigenous and non-Indigenous arsonist transcripts by 5-year group.

Year sentenced	N	Indigenous % (n)	Non-Indigenous % (n)
1990–1995	15	6.7 (1)	93.3 (14)
1996–2000	35	8.6 (3)	91.4 (32)
2001–2005	53	1.9 (1)	98.1 (52)
2006–2010	84	8.3 (7)	91.7 (77)
2011–2015	118	16.1 (19)	83.9 (99)
Total	305	10.2 (31)	89.8 (274)

Note: N = 305.

Indigenous status

Aboriginal defendants comprised 10% of the total sample obtained ($n = 31$). No defendants identified as a Torres Strait Islander. This group were sentenced in all jurisdictions, except Tasmania and the Australian Capital Territory, with the largest number of Aboriginal defendants being sentenced in the Northern Territory ($n = 17$). In the cases coded as Indigenous, it was clearly stated by the Magistrate or Judge that the defendant was Aboriginal. Indigenous arsonists comprised 16.1% of all arsonists whose transcripts were obtained between 2011 and 2015, and this was almost double the percentage obtained in the previous five-year period for this group, as depicted in the Table 3. A chi-square analysis, using Fisher's Exact Test, revealed a significant difference between the expected and observed number of Indigenous arsonists, as a percentage of all arsonists represented in the transcripts, and year group, $\chi^2(4, N = 305) = 8.88, p = .05$.

Aboriginal defendants were more likely to be reported to have used substances in connection with their arson offence than those from the non-Indigenous group. The offences committed by non-Indigenous defendants were significantly more likely to have been planned and to involve the use of accelerants than the offences committed by the Indigenous defendants.

Significant differences were also observed between the two groups in terms of the sentences granted upon conviction, and these are depicted in Table 1. Indigenous defendants

were more likely to receive a combination sentence of imprisonment and community supervision than non-Indigenous defendants, and they were also more likely to receive a custodial sentence of less than five years (54.8%) than the non-Indigenous group (40.5%). The Indigenous defendants were also more likely to have a history of offending as a juvenile identified by the court. Sixty-one percent of all Indigenous defendants were identified as having an Expressive motivation for their offences, compared to just 21% of the non-Indigenous group, and this difference was significant for both males, $\chi^2(2, n = 260) = 12.75, p < .001$, and females, $\chi^2(2, n = 34) = 6.29, p = .043$. Lastly, the proportion of mental health diagnoses identified by the courts in the non-Indigenous group was 47.4%, compared to 29% of the Aboriginal group; however, this difference fell marginally below .05 significance level, $\chi^2(1, N = 305) = 3.807, p = .051$.

Defendant's mental health

A range of diagnoses was identified including personality disorders, major mental illnesses, intellectual disabilities and childhood diagnoses. Table 4 presents the number of transcripts referring to previous or current (or both) mental health diagnoses and any form of treatment. More than one third of defendants were identified to have had a mental health diagnosis either as a child or as an adult ($n = 139, 45.5\%$), and adult-only diagnoses were found in 118 (38.7%) cases. Among the 25 diagnoses for personality disorder the most common

Table 4. Reference to mental health diagnosis, treatment, counselling or support, and Indigenous status.

Mental health diagnoses referred to at sentencing	%	<i>n</i>	Mental health treatment, counselling or support identified (<i>n</i>)	Indigenous status identified (<i>n</i>)
Court indicated no mental health diagnoses	14.4	44	6	7
Court indicated childhood disorder or diagnosis only	2.0	6	2	0
Court indicated both childhood and adult diagnoses	2.0	6	3	0
Court indicated adult mental illness alone	31.5	96	66	7
Court indicated adult personality disorder alone	3.0	9	1	0
Court indicated both adult mental illness and personality disorder	4.3	13	12	1
Court indicated intellectual disability	3.0	9	7	1
No reference to mental illness diagnosis or treatment by court	40.0	122	122	15

Note: *N* = 305.

were antisocial personality disorder (*n* = 4) and borderline personality disorder (*n* = 4). Seven transcripts referred to mixed diagnoses, two referred to schizoid personality disorder, and another eight indicated the diagnosis of a personality disorder but did not specify which type. For the 15 cases of childhood diagnoses, the most common diagnosis was attention deficit disorder/attention deficit hyperactivity disorder (*n* = 11). In 25.6% of transcripts the court referred to the defendant having engaged in previous psychiatric/medical treatment either in the community or in a residential facility (*n* = 78) and a further 6.2% (*n* = 19) who had previously received community-based treatment. There was no difference between the non-Indigenous defendants and the Indigenous defendants in terms of their history of previous mental health treatment, with the majority in each group having had no

experience of mental health treatment (68.6% and 64.5%, respectively).

There were 115 transcripts (37.7%) where the sentencing Judge or Magistrate noted a current mental illness, indicating a prevalence of depression (*n* = 31) and schizophrenia (*n* = 24). Other diagnoses were psychosis (*n* = 14), post-traumatic stress disorder/panic disorder (*n* = 10), bipolar disorder (*n* = 5), anxiety alone (*n* = 3) and mixed (such as depression and anxiety) or not specified (*n* = 28). Of the 34 female defendants, 48% were noted to have been diagnosed with a mental illness (*n* = 16), the most common diagnosis being depression and mixed depression and anxiety. In the male sample of arson defendants, 36.5% were identified as having been diagnosed with a mental illness at the time of sentence (*n* = 99). The most common diagnoses for males were depression (*n* = 27) and schizophrenia (*n* = 21). There were no

significant gender differences, $\chi^2(1, n = 305) = 0.034, p = .854$.

Previous convictions

Of the total sample of 305 defendants, the sentencing court indicated that 62% had previous convictions, in either the adult or the juvenile sector ($n = 189$). Eighteen male defendants were identified by the court as having previous convictions for arson, with the majority of these ($n = 15$) also having committed other types of offences. A juvenile criminal history was specifically identified in 41 cases, and courts specifically mentioned a lack of juvenile offending in 89 cases.

Exclusivity–versatility dichotomy

Not all transcripts identified the specific nature of any previous convictions, hence the discrimination between exclusivity of offending and versatility in offending can only be achieved for 264 cases. Where exclusivity and versatility could be ascertained, those defendants who had committed only arson offences and therefore could be described as ‘exclusive’ comprised 19.3% of the total sample ($n = 51$). Of this group nine were female defendants, and there was no difference between male and female defendants on this dimension, $\chi^2(1, n = 305) = 3.305, p = .069$. The majority of defendants ($n = 213, 80.7\%$) were ‘versatile’ in that their previous convictions were composed of a variety of offence types.

Chi-square analyses revealed significant differences between the two groups on juvenile offending, first-time sentence, substance use in the commission of the arson and the target of the arson. All of the transcripts involving exclusive arsonists specifically indicated that the defendant did not have a record of juvenile offending. In addition, 94% of this group were being sentenced for the first time. This was significantly different to the versatile cohort, where only 9.3% were being sentenced for the first time.

A significant difference emerged in terms of the choice of target for the exclusive and versatile groups. A greater proportion of exclusive firesetters set fire to their own property than the versatile group, who were more likely to set fire to the property of friends or relatives. Groups also differed on their use of substances in the commission of the arson, with substances used by 47.4% of versatile offenders but only 23.5% of the exclusive offenders. Table 5 shows the chi-square statistics for the versatile and exclusive groups of arsonists, across key variables.

Substances used in the offences

Defendants were identified as having been under the influence of a substance at the time of the arson offence in 42.6% of all cases ($n = 130$). Only those transcripts specifically indicating that the defendant was not under the influence of substances were coded as such. A small number of transcripts ($n = 28$) specifically identified that the defendant had not been influenced by any substances during the commission of the arson offence, and 147 transcripts were silent on the use of substances. Table 6 highlights the types of substances most commonly used in the commission of the remaining offences where substance use and Indigenous status were indicated. Non-Indigenous defendants were significantly more likely to have consumed substances during the commission of their arson offence, $\chi^2(5, n = 305) = 19.098, p = .002$.

Motivation

A number of motivations for firesetting were identified across the 305 transcripts, and these are outlined in Table 7. There were 212 transcripts where the firesetting was identified with an instrumental motivation, and 81 with an expressive motivation. Twelve transcripts, where motivation was not able to be determined due to limited information, were excluded from this analysis. Chi-square analyses found a significant difference between the

Table 5. Chi-square statistics for key variables across exclusive and versatile groups.

Variable	χ^2	df	Cramer's V or ϕ	n
Gender	3.3	1	.112	264
Juvenile offending mentioned	33.91***	1	.511	130
First-time sentence	147.994***	1	.765	253
Substance use mentioned	9.59**	1	.191	264
Co-offenders/solo offending	0.03	1	.012	264
Previous convictions for arson	3.82	1	.174	126
Expressive/instrumental	0.168	1	.025	259
Mental health diagnosis	0.578	1	.047	264
Target of arson	14.29**	3	.233	264
Use of accelerants	3.42	1	.134	191
Planned/unplanned offence	2.1	1	.091	256

** $p < .05$. *** $p < .001$.

Table 6. Use of substances in commission of arson offences by Indigenous status.

Substance used	n	Indigenous n (%)	Non-Indigenous n (%)
Alcohol only	76	11 (14.5)	65 (85.5)
Drugs only	31	3 (9.7)	28 (90.3)
Both drugs and alcohol	19	4 (21.1)	15 (78.9)
Alcohol and inhalants	4	1 (25)	3 (75)

Note: $N = 130$.

two categories of arsonist (Instrumental and Expressive) in terms of a history of mental illness. The latter group ($n = 81$) were more likely to have been diagnosed with a mental disorder ($n = 53$, 65.4%) than those whose firesetting served an instrumental purpose ($n = 79$, 37.3%), $\chi^2(1, n = 293) = 18.78$, $p < .001$, as detailed in Table 8. A significant relationship between type of motivation and the use of substances was also observed, $\chi^2(1, n = 293) = 13.407$, $p < .001$. Arsonists identified with an expressive motivation were also more likely to have used substances in the commission of their offence, as depicted in Table 9.

Offence characteristics

In addition to coding arsonist's characteristics, each transcript was coded for key characteristics associated with the arson offence/s. These characteristics include the target of the arson, the use of accelerants, the use of substances, whether the arson was committed in company or by an individual alone, and whether the offence was planned or largely impulsive. The most common target of the arson offence/s in the sample was property belonging to a relative or friend (29.5%, $n = 90$), followed by the firesetter's own residence or property, such as a vehicle (21.4%, $n = 65$). In a little more than

Table 7. Instrumental and expressive motivations for arson.

Arson motivation	Instrumental	Expressive
Anger prompting revenge or payback	82	28
Eliminate evidence/Crime concealment	61	0
Profit	36	0
Delusional: due to mental illness	0	20
Due to intoxication can't recall	1	12
To murder another person	14	0
Self-pity: emotionally upset	0	9
Excitement or sexual pleasure	0	6
Gang-related violence	5	0
Attract services or attention	5	0
Land management or back-burning	3	0
Racial or religious hatred	1	0
Other or mixed motives	4	6
Total	212	81

Note: *N* = 293.

Table 8. Relationship between mental health diagnoses and type of motivation.

Motivation	No mental disorder diagnosed <i>n</i> (%)	Mental disorder diagnosed <i>n</i> (%)	Total
Instrumental	133 (62.7)	79 (37.3)	212
Expressive	28 (34.6)	53 (65.4)	81
Total	161 (54.9)	132 (45.1)	293

Note: *N* = 293.

Table 9. Relationship between substance use and type of motivation.

Motivation	Transcript did not refer to substance use <i>n</i> (%)	Transcript referred to substance use <i>n</i> (%)	Total
Instrumental	134 (63.2)	78 (36.8)	212
Expressive	32 (39.5)	49 (60.5)	81
Total	166 (56.7)	127 (43.3)	293

Note: *N* = 293.

half of the cases it was noted by the sentencing Judge or Magistrate that accelerants such as petrol, oil or methylated spirits were used to set the fires (53%, *n* = 161). An accelerant was more likely used by both male and female firesetters than not used.

In 32% of all transcripts the arson offences were committed by more than one offender (*n* = 97), and of these cases, the majority of co-offenders were unrelated (*n* = 85). There was little difference between the male and female firesetters in terms of whether they

Table 10. Linear trend statistics and model summaries based on simple regression analyses over 25 years.

Variable	<i>R</i> ²	<i>B</i>	<i>SEB</i>	<i>β</i>	<i>t</i>
Mental health diagnosis	.69	2.78	0.38	0.83	7.23***
Substance use	.32	1.44	0.44	0.56	3.28**
Indigenous status	.05	0.34	0.31	0.22	0.28
Female gender	.31	0.64	0.20	0.55	3.19**

p* < .05. *p* < .001.

offended alone or in company, with 31.3% of the male firesetters and 35.3% of the female firesetters committing arson with others. Of the 305 transcripts reviewed, over two thirds of offences were planned in advance of commission (*n* = 204).

Trends in arson offences across time

Trend analyses were based on the research hypotheses detailed previously. Significant linear trends were found for the presence of a mental health diagnosis and the use of substances in connection with the arson offence over the 25-year period. The linear trend for the percentage of arsonists with a mental health diagnosis accounted for 69% of variation within the sample. This is significant (*t* = 7.23, *p* < .001) and suggests a linear relationship between the percentage of arsonists with a mental health diagnosis and the year sentenced. The linear trend for the use of illegal substances during the commission of an arson offence was also significant (*t* = 3.28, *p* < .05) but accounted for less variance, (32%). Table 10 presents the linear trend statistics and model summaries for each of these variables.

A further, unexpected, linear trend was identified for females being sentenced for arson over the 25-year period (*t* = 0.004, *p* < .00), accounting for 31% of variance. There was no evidence of a trend in the number of Indigenous arsonists appearing before the courts over the period. Trend statistics, indicating progressive increases in the number of female arsonists, and arson offenders

presenting before the Australian courts with a history of substance use and mental illness diagnoses, are provided in Table 11. Where a statistically significant linear trend was identified, projections for the next five years (following the 2015 cut-off for the collection and analysis of court transcripts) were calculated and are presented. These projections suggest that 80% of arsonists being sentenced in 2020 will present with a mental health diagnosis, 60% will have used substances in connection with their offence, and 19% will be female.

Discussion

This study is the first to investigate the characteristics of arsonists over a 25-year period and review the features associated with arson offending in all Australian jurisdictions. The results of this study support the four hypotheses: (a) that the proportion of Australian arsonists identified as having a mental health diagnosis has increased over the period 1990 to 2015; (b) that the use of illegal substances in the commission of arson offences has increased over this period; (c) that Australian arsonists demonstrate a versatile range of offending behaviours; and (d) that arsonists with an expressive motivation are more likely to have a history of substance use and mental illness. The fifth area investigated, that of the similarities and differences between the Indigenous group and the non-Indigenous group, identified key factors separating the two groups. Trends in the characteristics of

Table 11. Linear trend fit for percentage statistic (1991–2015) and projections to 2020 for mental health diagnosis, substance use and female arsonists.

Year	Mental health diagnosis	Substance use	Female arsonists
1991	0.37354	18.66154	0.26523
1992	3.15208	20.10308	0.90746
1993	5.93062	21.54462	1.54969
1994	8.70915	22.98615	2.19192
1995	11.48769	24.42769	2.83415
1996	14.26623	25.86923	3.47638
1997	17.04477	27.31077	4.11862
1998	19.82331	28.75231	4.76085
1999	22.60185	30.19385	5.40308
2000	25.38038	31.63538	6.04531
2001	28.15892	33.07692	6.68754
2002	30.93746	34.51846	7.32977
2003	33.71600	35.96000	7.97200
2004	36.49454	37.40154	8.61423
2005	39.27308	38.84308	9.25646
2006	42.05162	40.28462	9.89869
2007	44.83015	41.72615	10.54092
2008	47.60869	43.16769	11.18315
2009	50.38723	44.60923	11.82538
2010	53.16577	46.05077	12.46762
2011	55.94431	47.49231	13.10985
2012	58.72285	48.93385	13.75208
2013	61.50138	50.37538	14.39431
2014	64.27992	51.81692	15.03654
2015	67.05846	53.25846	15.67877
2016	69.83700	54.70000	16.32100
2017	72.61554	56.14154	16.96323
2018	75.39408	57.58308	17.60546
2019	78.17262	59.02462	18.24769
2020	80.95115	60.46615	18.88992

Note: $N=305$. No transcripts were obtained from 1990.

those convicted of arson in Australia emerged, highlighting likely increases in mental health diagnoses and the use of substances.

Offender demographics and offence characteristics

This study supports previous research on the gender breakdown of arsonists (Enayati et al., 2008; Hoertel, Le Strat, Schuster, & Limosin, 2011) in that the clear majority of arson transcripts obtained over the 25-year period referred to male defendants (89%) aged in

their mid-thirties. The arson offences described in this sample of transcripts pointed to the most likely target being the arsonist's home or the home of known friends/relatives, followed by random community property or public buildings. This is consistent with findings by Gannon and Pina (2010) and Green et al. (2014) who found that the most common target for arson offences was residential properties.

Accelerants were used in the majority of offences (52.8%), and two thirds of this sample committed their offence alone, rather than

in company with others. This study also found that arson offences were more likely to be planned than unplanned, suggesting characteristics of independence, resourcefulness and determination. These characteristics are consistent with an instrumental motivation (Canter & Fritzon, 1998) and also perhaps a level of expertise, as outlined recently by H. Butler and Gannon (2015).

Increased prevalence of diagnosed mental illness and personality disorder

The high prevalence of diagnosed mental illness among arson offenders identified in the current research replicates earlier findings (Anwar et al., 2011; Ducat et al., 2013; Harris & Rice, 1996; MacKay et al., 2006). Over the 25-year period, Australian courts referred to a mental health diagnosis at the time of sentence in 37.7% of cases. It is difficult to establish how this percentage for arsonists compares with the percentage of all defendants identified with a mental illness at the time of sentencing, as most studies collect such diagnostic information once individuals have been received into custody or are in police detention (Forsythe & Gaffney, 2012; Kennedy-Hendricks, Huskamp, Rutkow, & Barry, 2016; Moore, Sunjic, Kaye, Archer, & Indig, 2016). Courts in Australia do not report on the number of defendants identified to have a mental illness; however, correctional agencies do so regularly. These estimates have suggested that up to 80% of new receptions to custody in Australia have been diagnosed with a mental illness (Australian Institute of Health and Welfare, 2015; T. Butler, Andrews, Allnutt, Sakashita, & Basson, 2006). The percentage of arsonists identified in this study who presented to court with a mental illness is therefore consistent with results of earlier research.

The trend analysis showed the projected proportion of arsonists presenting to court with a diagnosed mental illness, such that by 2020 it is estimated that 80% of convicted arsonists in this country will have been diagnosed with a mental illness. Considering this trend in

combination with future predictions indicating a significant increase in the number of women appearing before the courts charged with arson, it is likely that female arsonists with mental health diagnoses will feature prominently as a challenging group going forward.

High rates of mental illness point to implications for treatment. In particular, it is likely that treatment providers in the future may need to assume, and assess for, a history of mental illness when establishing programmes for fire-setters. The substantial number of firesetters diagnosed with a mental illness may impact on expected treatment outcomes, in terms of interfering with the development of participants' insight and self-awareness at times. A high proportion of firesetters with a mental illness is also likely to impact on treatment programme considerations such as the timing, frequency and length of sessions, and warrant careful attention to content to reduce the likelihood of retriggering symptoms.

This study also examined whether personality disorders were diagnosed at rates observed in previous studies. A relationship between the specific diagnosis of antisocial personality disorder and firesetting in adults, and its precursor conduct disorder in adolescents, has been established (Kosky & Silburn, 1984; Lindberg et al., 2005; Martin, Bergen, Richardson, Roeger, & Allison, 2004). However, similar rates were not observed in this sample. It is interesting to note that only eight defendants were identified as having been diagnosed with an antisocial personality disorder (APD) at the time of sentencing, four of whom were diagnosed with APD in conjunction with another personality disorder. Each of these defendants was male, with previous convictions and considered to be a versatile offender.

A low percentage of identified antisocial personality disorder diagnoses in these sentencing transcripts may simply reflect the courts' attention to this diagnosis when reviewing these cases, and not necessarily the true incidence of the disorder. Given that in

Australia, the *Verdins* principles (R v. Verdins, 2007), which govern the sentencing of defendants with a mental illness, do not generally incorporate personality disorder diagnoses (Walvisch & Carroll, 2017), personality disorders are often given less weight as a sentencing consideration. Only further analysis of judicial sentencing considerations in arson cases that specifically seek the judiciary's perspective on their understanding of the relationship between personality disorders and arson will clarify this issue.

Substance use and arson

Substance use was noted in 42.6% of all arson offences over the 25-year period, with the most common substance being alcohol. A linear trend analysis projected that the use of substances in connection with arson offences would increase over the next five years, and it was estimated that by the year 2020, 60% of arsonists appearing before the courts for sentence would have used an illegal substance in the commission of that offence. This not only complicates the sentencing process in terms of understanding defendants' prospects of rehabilitation, but also increases the risk of future offending if this prominent criminogenic need is not addressed (Kellen, Powers, & Birnbaum, 2017; Vaughn, Salas-Wright, & Reingle-Gonzalez, 2016).

Further research into the relationship between substance use and arson may consider whether an increased use of substances impacts on the percentage of unplanned or opportunistic arson offending, given the relationship between substance use and dysregulated and impulsive antisocial behaviour (Scholes-Balog, Hemphill, Evans-Whipp, Toumbourou & Patton, 2016). It could be expected that increased substance use would reduce offenders' consideration of the impact of fire, specifically the damage it might cause or the danger it may present to others. The relationship between substance use and firesetting also points to implications for the sequencing of treatment

modules, with the treatment of substance abuse a likely priority if this factor is assessed as a key precipitating or perpetuating factor (Christofides, Johnstone, & Musa, 2011; Wilson, Bandyopadhyay, Yang, Cerulli, & Morse, 2018).

Arsonists are versatile and have previous convictions

As demonstrated in previous studies (Doley, 2009; Ducat et al., 2013), this sample comprised a majority of versatile offenders who had committed a range of offence types. This group of arsonists was found to be significantly different from those who had only committed arson offences – the exclusive group, in terms of previous convictions, substance use and the target of their offending. The exclusive group had no history of juvenile offences and were significantly more likely to be attending court for the first time than were the versatile cohort. Members of the exclusive group were less likely to use substances in the commission of their offence than the versatile group. These findings support the conclusions of Ducat et al. (2013) who also found that exclusive firesetters in their sample were less likely than their versatile counterparts to have used substances in their offending, or to have previous convictions.

The versatile group were more likely to target the property of others, whereas the exclusive group were more likely to target their own property. Based on the information contained in the sentencing transcripts, there was no difference between the two groups (versatile or exclusive) as to whether their firesetting was motivated by instrumental (goal-seeking) or expressive (emotional acting-out) purposes. This is an interesting result as it would have been expected that the versatile group would have shown more instrumental motivations for firesetting given their greater tendency towards general criminality and substance use.

These results, in addition to the finding that even the small group of repeat arsonists in

this sample were versatile in their offending, supports findings from other studies that exclusive arsonists are a very small subgroup of all arsonists. This suggests the need for arson treatment to maintain a focus on generic criminogenic factors such as substance use and the management of mental health diagnoses.

Differences between Indigenous and non-Indigenous arsonists

The fourth area of interest in this study concerned an exploration of similarities and differences between the Indigenous group in this sample of Australian arsonists and their non-Indigenous counterparts. The Indigenous group was significantly more likely to have been reported by the court to have set fires under the influence of substances. Their offences were more likely to have been unplanned or opportunistic, occurring without the use of accelerants. In terms of motivation, this group was significantly more likely to have been identified with an expressive motivation for their firesetting. This combination of characteristics – substance use, unplanned and emotionally expressive behaviour – reflects elements previously identified in the offending patterns of Australian Indigenous offenders (Day et al., 2008; Weatherburn, 2014), which are often attributed to intergenerational experiences of racism, trauma, dislocation and marginalisation (Cunneen, 2006; Seidler, 2010; Weatherburn, Snowball, & Hunter, 2006).

Similar to Geller and colleagues' 1992 thesis (Geller, Fisher, & Moynihan, 1992) that firesetting is often used to communicate distress, this study points to the use of fire by Aboriginal arsonists to impulsively express themselves, when emotional regulation and coping behaviours are diminished due to the consumption of drugs or alcohol. It raises questions as to the pathway to firesetting for this group, and whether the Multi-Trajectory Theory of Adult Firesetting (M-TTAF) trajectories, as developed by Gannon et al. (2012), sufficiently captures the historical emotional

and behavioural turmoil experienced in many Australian Indigenous communities. Further analysis of background factors and underlying social-psychological dynamics is indicated given the implications for the treatment of fire-setting behaviours in this group.

One of the usual correlates to an expressive motivation – that of a diagnosed mental illness – was infrequently observed in the Indigenous group. Only 29% of the Indigenous arsonists were identified as having a previous or current mental health diagnosis compared to 47% of the non-Indigenous group. While this difference was not statistically significant ($p = .051$), it did indicate a divergence between the groups, which is worthy of further exploration. Additional research to investigate whether this difference may in fact reflect a differential use of mental health services between Indigenous and non-Indigenous peoples, as opposed to differences in the presence of symptoms of mental illness, is indicated. Westerman's (2004) contention that Indigenous people are more likely to pursue support within their community prior to seeking external agency assistance may account for reduced formal identification of mental illnesses amongst this group, and consequentially diminished reporting in court transcripts.

Further evidence of differential service uptake has been reported by Sodhi-Berry, Preen, Alan, Knuiman, and Morgan (2014) who found differences between Indigenous and non-Indigenous recipients of government-based mental health services in Western Australia. These authors found that Indigenous offenders were more likely to have sought and received treatment for substance use disorders, but less likely for other disorders such as personality disorders, adjustment disorders or affective psychoses, than non-Indigenous offenders. Several reasons for the under-reporting of mental illness in Indigenous women in particular have been postulated, including the intimidating environment of the criminal justice system, the

domination of male legal representatives and the lack of available mental health services in some regional communities in Australia (McCausland & Vivian, 2010).

Indigenous arson raises sensitive issues given the historical use of fire for cultural purposes within Indigenous communities over thousands of years (Gammage, 2014). It has not been considered in the firesetting literature previously. This study, as the first to explore differences between Indigenous and non-Indigenous firesetting, suggests that further detailed interviews with Indigenous firesetters are necessary to identify their implicit theories and triggers, the social factors paving their particular pathway and the utility of current arson theories.

Limitations

There were several methodological limitations identified, and the results of this study must be interpreted in this context. First, it is possible that some of the defendants in this study amended their reasons for offending between committing the arson offence and appearing in court. The reported motivation for firesetting may have changed by the time it is discussed by the sentencing Judge, as some defendants may have altered their statements when interviewed by police and then perhaps when interviewed by their lawyers. This may lead to the information presented to the court during the pre-sentencing discourse having evolved over a period of time, perhaps in order to reduce the degree of planning or the level of emotion depicted in the crime, in an effort to attract a lesser sentence.

The courts did not identify any of the defendants included in this study as Torres Strait Islanders. It is recognised that there may have been defendants referred to by the sentencing court as Aboriginal, who in fact also identify as a Torres Strait Islander due to their family lineage. The distinction is important because it would have allowed analyses between Aboriginal and Islander groups,

further clarifying the role of culture and place of origin in arson behaviour.

The results of this study are limited by the disproportionality of available transcripts across jurisdictions, courts and years. A majority of transcripts were drawn from recent years as each jurisdiction did not provide online access to sentencing transcripts at the same time. A reconciliation of the arson arrest data from policing agencies and the number of publicly available sentencing transcripts across each jurisdiction was beyond the scope of this study. Such an analysis would identify the number of arson cases being presented to courts, details of which were publicly unavailable for inclusion in this study. Therefore it is likely that numerous arson cases heard between 1990 and 2015 were not publicly reported, and these cases may have lent additional substance and insight into the behaviour of Australian arsonists.

Future research

This study is the first known analysis of arson in Australia to cover a 25-year period, and as such it is exploratory in design and cautious in the conclusions drawn. Future research will identify court transcripts available since 2015 to extend the findings obtained and examine any changes in the direction of the trends observed. Further research is warranted to assess any changing patterns in the level of planning associated with arson offending across recent decades, in order to determine correlations with other risk factors and identify emerging treatment needs.

Further analysis of the factors contributing to firesetting in Indigenous communities is indicated by this study, which highlighted differences between Indigenous and non-Indigenous firesetting. These differences also support the call for an assessment of the relevance of current theories of adult firesetting, such as the M-TTAF (Gannon et al., 2012), and also indicate that alternative approaches to the treatment

of Indigenous arsonists may be warranted, so as to maximise cultural relevance and treatment efficacy.

Ethical standards

Declaration of conflicts of interest

Therese Ellis Smith has declared no conflicts of interest. Bruce D. Watt has declared no conflicts of interest. Rebekah M. Doley has declared no conflicts of interest

Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors.

References

- Anwar, S., Långström, N., Grann, M., & Fazel, S. (2011). Is arson the crime most strongly associated with psychosis? – A national case-control study of arson risk in schizophrenia and other psychoses. *Schizophrenia Bulletin*, 37, 580–586. doi:10.1093/schbul/sbp098
- Australian Institute of Health and Welfare. (2015). The Health of Australia's Prisoners 2015. Cat. no. PHE207. Canberra: AIHW. Retrieved from <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129553682>
- Bennett, T., Holloway, K., & Farrington, D. (2008). The statistical association between drug misuse and crime: A meta-analysis. *Aggression and Violent Behaviour*, 13(2), 107–118. doi:10.1016/j.avb.2008.02.001
- Brett, A. (2004). 'Kindling theory' in arson: How dangerous are firesetters? *Australian and New Zealand Journal of Psychiatry*, 38, 419–425. doi:10.1111/j.1440-1614.2004.01378.x
- Bryant, C. (2008). Understanding bushfire: Trends in deliberate vegetation fires in Australia. Technical and background paper series No 27, Canberra: Australian Institute of Criminology. <https://aic.gov.au/publications/tbp/tbp027>
- Butken, S., Skurtveit, P., Stangeland, M., Gossop, A.B., Willersrud, H., Waal, H., ... Clausen, T. (2011). Criminal convictions among dependent heroin users during a 3-year period prior to opioid maintenance treatment: A longitudinal national cohort study. *Journal of Substance Abuse Treatment*, 41(4), 407–414. doi:10.1016/j.jsat.2011.06.006
- Butler, H., & Gannon, T. A. (2015). The scripts and expertise of firesetters: A preliminary conceptualisation. *Aggression and Violent Behavior*, 20, 72–81. doi:10.1016/j.avb.2014.12.011
- Butler, T., Andrews, G., Allnutt, C., Sakashita, N. E., & Basson, J. (2006). Mental disorders in Australian prisoners: A comparison with a community sample. *The Australian and New Zealand Journal of Psychiatry*, 40(3), 272–276. doi:10.1111/j.1440-1614.2006.01785.x
- Canter, D., & Fritzon, K. (1998). Differentiating arsonists: A model of firesetting actions and characteristics. *Legal and Criminological Psychology*, 3, 73–96. doi:10.1111/j.2044-8333.1998.tb00352.x
- Chandler, R. E., & Scott, E. M. (2011). *Statistical methods for trend detection and analysis in the environmental sciences*. West Sussex: JohnWiley & Sons Ltd.
- Christofides, S., Johnstone, L., & Musa, M. (2011). Chipping in: Clinical psychologists' descriptions of their use of formulation in multidisciplinary team working. *Psychology and Psychotherapy*, 85(4) 424–435. doi:10.1111/j.2044-8341.2011.02041.x
- Coid, J., Wilkins, J., & Coid, B. (1999). Firesetting, pyromania and self-mutilation in female remanded prisoners. *Journal of Forensic Psychiatry*, 10(1), 119–130. doi:10.1080/09585189908402143
- Cunneen, C. (2006). Racism, discrimination and the over-representation of indigenous people in the criminal justice system: Some conceptual and explanatory issues. *Current Issues in Criminal Justice*, 17(3), 329–346. <http://heinonline.org/HOL/Page?handle=hein.journals/cicj17&id=327&collection=journals&index=> doi:10.1080/10345329.2006.12036363
- Dalhuisen, L., Koenraadt, F., & Liem, M. (2015). Psychotic versus non-psychotic firesetters: Similarities and differences in characteristics. *The Journal of Forensic Psychiatry and Psychology*, 26(4), 439–460. doi:10.1080/14789949.2015.1018927
- Day, A., Davey, L., Wanganeen, R., Howells, K., De Santolo, J., & Nakata, M. (2008). The significance of context: Stories from South Australia. In A. Day, M. Nakata, & K. Howells, (Eds.), *Anger and indigenous*

- men. Sydney: The Federation Press. <http://hdl.handle.net/10453/8194>
- DeMatteo, D., Filone, S., & Davis, J. (2015). Substance use and crime. In B. L. Cutler & P. A. Zapf (Eds.), *APA handbook of forensic psychology, Vol. 1: Individual and situational influences in criminal and civil contexts* (pp. 325–349). Washington DC, United States of America.
- Dickens, G., Sugarman, P., Ahmad, F., Edgar, S., Hofberg, K., & Tewari, S. (2007). Gender differences amongst adult arsonist at psychiatric assessment. *Medicine, Science and the Law*, 47, 233–238. doi:10.1258/rsmmsl.47.3.233
- Dickens, G., Sugarman, P., Edgar, S., Hofberg, K., Tewari, S., & Ahmad, F. (2009). Recidivism and dangerousness in arsonists. *Journal of Forensic Psychiatry and Psychology*, 20, 621–639. doi:10.1080/14789940903174006
- Doley, R. (2003a). Making sense of arson through classification. *Psychiatry, Psychology and Law*, 10, 346–352. doi:10.1375/pplt.2003.10.2.346
- Doley, R. (2003b). Pyromania: Fact or fiction? *British Journal of Criminology*, 43, 797–807. doi:10.1093/bjc/43.4.797
- Doley, R. (2009). *A snapshot of serial arson in Australia*. Koln, Germany: Lambert Academy Publishing.
- Ducat, L., McEwan, T., & Ogloff, J. (2013). Comparing characteristics of firesetting and non-firesetting offenders: Are firesetters a special case? *Journal of Forensic Psychiatry and Psychology*, 24(5), 549–569. doi:10.1080/14789949.2013.821514
- Enayati, J., Grann, M., Lubbe, S., & Fazel, S. (2008). Psychiatric morbidity in arsonists referred for forensic psychiatric assessment in Sweden. *Journal of Forensic Psychiatry and Psychology*, 19, 139–147. doi:10.1080/14789940701789500
- Fazel, S., Bains, P., & Doll, H. (2006). Substance abuse and dependence in prisoners: A systematic review. *Addiction*, 101, 181–191. doi:10.1111/j.1360-0443.2006.01316
- Ferrante, A. M. (2012). Assessing the influence of “standard” and “culturally specific” risk factors on the prevalence and frequency of offending: The case of Indigenous Australians. *Race and Justice*, 3(1), 58–82. doi:10.1177/2153368712462410
- Forsythe, L., & Gaffney, A. (2012). Mental disorder prevalence at the gateway to the criminal justice system. *Trends and Issues in Crime and Criminal Justice*, No 438. Canberra: Australian Institute of Criminology. <https://search.informit.com.au/documentSummary;dn=578729696513444;r-es=IELHSS>
- Gammage, W. (2014). *The biggest estate on earth: How Aborigines made Australia*. Sydney: Allen & Unwin. <http://hdl.handle.net/1885/58359>
- Gannon, T. A., & Pina, A. (2010). Firesetting: Psychopathology, theory and treatment. *Aggression and Violent Behaviour*, 15, 224–238. doi:10.1016/j.avb.2010.01.001
- Gannon, T. A., Ó Ciardha, C., Doley, R. M., & Alleyne, E. (2012). The multi-trajectory theory of adult firesetting. *Aggression and Violent Behaviour*, 17, 107–121. doi:10.1016/j.avb.2011.08.001
- Geller, J. L., Fisher, W. H., & Moynihan, K. (1992). Adult lifetime prevalence of firesetting behaviors in a state hospital population. *Psychiatric Quarterly*, 63(2), 129–142. <https://doi.org/10.1007/BF01065986>
- Goldsmid, S., & Willis, M. (2016). Methamphetamine use and acquisitive crime: Evidence of a relationship. *Trends and Issues in Crime and Criminal Justice*, 516, 1–14. <https://search.informit.com.au/documentSummary;dn=440966342022158;r-es=IELHSS>
- Green, B., Lowry, T. J., Pathé, M., & McVie, N. (2014). Firesetting patterns, symptoms and motivations of insanity acquittees charged with arson offences. *Psychiatry, Psychology and Law*, 21(6), 937–946. doi:10.1080/13218719.2014.918080
- Harris, G. T., & Rice, M. E. (1996). A typology of mentally disordered firesetters. *Journal of Inter-personal Violence*, 11(3), 351–363. doi:10.1177/088626096011003003
- Hoertel, N., Le Strat, Y., Schuster, J.-P., & Limosin, F. (2011). Gender differences in firesetting: Results from the national epidemiologic survey on alcohol and related conditions (NESARC). *Psychiatry Research*, 190, 352–358. doi:10.1016/j.psychres.2011.05.045
- Jorm, A. F., Bourchier, S. J., Cvetkovski, S., & Stewart, G. (2012). Mental health of Indigenous Australians: A review of findings from community surveys. *The Medical Journal of Australia*, 196(2), 118–121. doi:10.5694/mja11.10041
- Kellen, A., Powers, L., & Birnbaum, R. (2017). Drug use, addiction, and the criminal justice system. In R. Csiernik & W. S. Rowe (Eds.), *Responding to the oppression of*

- addiction (pp. 260–280). Toronto: Canadian Scholars.
- Kennedy-Hendricks, A., Huskamp, H. A., Rutkow, L., & Barry, C. L. (2016). Improving access to care and reducing involvement in the criminal justice system for people with mental illness. *Health Affairs*, 35(6), 1076–1083. doi:10.1377/hlthaff.2016.0006
- Koetzle, D. (2014). Substance use and crime: Identifying and treating those in need. *International Journal of Offender Therapy and Comparative Criminology*, 58(6), 635–637. doi:10.1177/0306624X14533110
- Kosky, R., & Silburn, S. (1984). Children who light fires: A comparison between firesetters and nonfiresetters referred to a child psychiatric outpatient service. *Australian and New Zealand Journal of Psychiatry*, 18(3), 251–255. doi:10.3109/00048678409161298
- Lennings, C. J., Copeland, J., & Howard, J. (2003). Substance use patterns of young offenders and violent crime. *Aggressive Behaviour*, 29(5), 414–422. doi:10.1002/ab.10048
- Lindberg, N., Holli, M., Tani, P., & Virkkunen, M. (2005). Looking for pyromania: Characteristics of a consecutive sample of Finnish male criminals with histories of recidivistic fire-setting between 1973 and 1993. *BMC Psychiatry*, 5(47), 1–5. <https://doi.org/10.1186/1471-244X-5-47>
- MacKay, S., Henderson, J., Del Bove, G., Marton, P., Warling, D., & Root, C. (2006). Fire interest and antisociality as risk factors in the severity and persistence of juvenile firesetting. *Journal of the American Academy of Child and Adolescent Psychiatry*, 45, 1077–1084. doi:10.1097/01.chi.0000227881.50404.ca
- McCausland, R., & Vivian, A. (2010). Why do some Aboriginal communities have lower crimes rates than others? A pilot study. *Australian and New Zealand Journal of Criminology*, 43(2), 301–332. Retrieved from <http://search.informit.com.au/documentSummary;dn=338785665030613;res=IELHSS> doi:10.1375/acri.43.2.301
- McEwan, T., & Ducat, L. (2016). The role of mental disorder in firesetting behaviour. In R. M. Doley, G. L. Dickens, & T. A. Gannon (Eds.), *The psychology of arson* (pp. 211–227). London: Routledge.
- Martin, G., Bergen, H. A., Richardson, A. S., Roeger, L., & Allison, S. (2004). Correlates of firesetting in a community sample of young adolescents. *Australian and New Zealand Journal of Psychiatry*, 38, 148–154. doi:10.1111/j.1440-1614.2004.01318.x
- Moore, E., Sunjic, S., Kaye, S., Archer, V., & Indig, D. (2016). Adult ADHD among NSW prisoners: Prevalence and psychiatric comorbidity. *Journal of Attention Disorders*, 20(11), 958–967. doi:10.1177/1087054713506263
- Muller, D. (2009). Using crime prevention to reduce deliberate bushfires in Australia. AIC Report Research and Policy Series, 98. Canberra: Australian Institute of Criminology. <https://search.informit.com.au/documentSummary;dn=707985043730722;res=IELAPA>
- Ó Ciardha, C., Barnoux, M., Alleyne, E., Tyler, N., Mozova, K., & Gannon, T. (2014). Multiple factors in the assessment of firesetters' fire interest and attitudes. *Legal and Criminological Psychology*, 20, 37–47. doi:10.1111/lcrp.12065
- Ogloff, J. R., Talevski, D., Lemphers, A., Wood, M., & Simmons, M. (2015). Co-occurring mental illness, substance use disorders, and antisocial personality disorder among clients of forensic mental health services. *Psychiatric Rehabilitation Journal*, 38(1), 16–23. doi:10.1037/prj0000088
- R v Verdins. (2007) 16 VR 269.
- Rollings, K. (2008). *Counting the costs of crime in Australia: A 2005 update*. Canberra, Australia: Australian Institute of Criminology. <https://www.ncjrs.gov/App/Publications/abstract.aspx?ID=245560>
- Scholes-Balog, K. E., Hemphill, S. A., Evans-Whipp, T. J., Toumbourou, & Patton, G. C. (2016). Developmental trajectories of adolescent cannabis use and their relationship to young adult social and behavioural adjustment: A longitudinal study of Australian youth. *Addictive Behaviours*, 53, 11–18. doi:10.1016/j.addbeh.2015.09.008
- Seidler, K. (2010). *Crime, culture & violence: Understanding how masculinity and identity shapes offending*. Bowen Hills: Australian Academic Press. <https://search.informit.com.au/documentSummary;dn=084480335910275;res=IELHSS>
- Sodhi-Berry, N., Preen, D., Alan, J., Knuiman, M., & Morgan, V. (2014). Pre-sentence mental health service use by adult offenders in Western Australia: baseline results from a longitudinal whole-population cohort study. *Criminal Behaviour and Mental Health*, 24, 204–221. <https://doi.org/10.1002/cbm.1901>
- Smith, R. G., Jorna, P., Sweeney, J., & Fuller, G. (2014). *Counting the costs of crime in*

- Australian: A 2011 estimate* (pp. 937–946). Canberra: Australian Institute of Criminology. <https://search.informit.com.au/documentSummary;dn=959831431592602;res=IELHSS>
- Tyler, N., Gannon, T. A., Lockerbie, L., King, T., Dickens, G. L., & De Burca, C. (2013). A firesetting offense chain for mentally disordered offenders. *Criminal Justice and Behavior*, 41, 512–530. doi:10.1177/0093854813510911
- Tyler, N., & Gannon, T. (2017). Pathways to firesetting for mentally disordered offenders: A preliminary examination. *International Journal of Offender Therapy and Comparative Criminology*, 61(8), 938–955.
- Vaughn, M. G., Fu, Q., DeLisi, M., Wright, J. P., Beaver, K. M., Perron, B. E., ... (2010). Prevalence and correlates of fire-setting in the United States: Results from the national Epidemiologic Survey on Alcohol and Related Conditions. *Comprehensive Psychiatry*, 51(3), 217–223. doi:10.1016/j.comppsy.2009.06.002
- Vaughn, M. G., Salas-Wright, C. P., & Reingle-Gonzalez, J. M. (2016). Addiction and crime: The importance of asymmetry in offending and the life course. *Journal of Addictive Disorders*, 35(4), 213–217. doi:10.1080/10550887.2016.1189658
- Walvisch, J., & Carroll, A. (2017). Sentencing offenders with personality disorders: A critical analysis of DPP (Vic) v O'Neill. *Melbourne Law Review*, 41, 417–444.
- Wang, M., Shen, J., Liu, X., Deng, Y., Li, J., Finch, E., & Wolff, K. (2017). Reliability and validity of the treatment outcome profile among patients attending methadone maintenance treatment programs in Kunming, China. *Journal of Substance Abuse Treatment*, 77, 89–94. doi:10.1016/j.jsat.2017.03.004
- Weatherburn, D. (2014). *Arresting incarceration: Pathways out of Indigenous imprisonment*. Canberra: Aboriginal Studies Press.
- Weatherburn, D., Snowball, L., & Hunter, B. (2006). The economic and social factors underpinning Indigenous contact with the justice system: Results from the 2002 NATSISS survey. *Crime and Justice Bulletin*, Contemporary Issues in Crime and Justice, 104, 1–16. Sydney: NSW Bureau of Crime Statistics and Research. <https://search.informit.com.au/documentSummary;dn=350466963608649;res=IEL HSS>
- Westerman, T. G. (2004). Models of intervention: Incorporating traditional with westernized models of service delivery. Armidale, New South Wales.
- Wilson, J. L., Bandyopadhyay, S., Yang, H., Cerulli, C., & Morse, D. S. (2018). Identifying predictors of substance use and recidivism outcome trajectories among drug treatment court clients. *Criminal Justice and Behaviour*, 45(4), 447–467. doi:10.1177/00938548177378
- Wundersitz, J. (2010). Indigenous perpetrators of violence: Prevalence and risk factors for offending. Research and Public Policy Series No 105, Canberra: Australian Institute of Criminology. <https://search.informit.com.au/documentSummary;dn=613237959283630;res=IELHSS>